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ABSTRACT

The study compared the relationship of the contract plan of student evaluation and a traditional type of evaluation, for changes in knowledge and attitudes during a college course in ecological relationships. The Syracuse Environmental Awareness Test was used to measure both cognitive and affective changes. In the experimental group the contract plan of evaluation was utilized. Subjects were evaluated on the number of course objectives which were completed satisfactorily. In the control group, a traditional type of student evaluation was used. The students were evaluated on the scores they received on three examinations. Although there was no statistically significant difference between the two groups when compared, there were several factors which gave credence to the hypothesis that the traditional method was superior to the contract method. First, there was a significant increase in cognitive knowledge for the control group between the pretest and the posttest, while in the experimental group there was no significant increase. Second, the experimental group had a larger percentage of Health Science majors than did the control group. If it is valid to assume that Health Science majors would be more highly motivated to do well in a course in their major field of study; then the experimental group should have demonstrated greater increases in cognitive and affective behavior. (RC)

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Contract Grading - Traditional Grading: A Comparison

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The need for effective grading procedures is important to Health Educators. Alternatives to traditional grading procedures such as self evaluation, pass-fail grading, credit/no credit, blanket grading and the contract system has been implemented with varying degrees of success by Health Educators. These alternatives to traditional grading procedures like any educational innovation, should be subject to constant research and analysis before they are adopted by the educational system.

The purpose of this study was to compare the relationship of the contract plan of evaluation and a traditional type of evaluation, for changes in Knowledge and Attitudes during a College course in ecological relationships.

The nature and quantity of research concerning the contract plan of evaluation has not been adequate. There is a lack of research in which experimental designs have been utilized to compare the relationship of the contract plan of evaluation and traditional grading procedures for changes in students' knowledge and attitudes. As is anticipated, findings from this study gives directions to educators considering replacing the traditional methods of evaluation with the contract plan of evaluation.

Research Methodology

Selection of Subjects

The subjects of this study were students registered for Hls. 303.1 and 303.2 Ecological Relationships I in the Fall 1973 term, in the Health Science Department at the State University of New York, College at Brockport. The experimental group consisted of 26 students, while the control group was made up of 22 students. The subjects were predominantly health science majors at Brockport. The classes met three times a week for fifty minutes during a twelve week period.

Measuring Instrument

The Syracuse Environmental Awareness test was utilized to measure both cognitive and affective changes. Forms A and B, the cognitive test, consist of 56 multiple choice questions each. Forms A and B were designed to be equivalent tests and therefore may be interchangeable. The content breakdown for Forms A and B is shown in Table I.

Form D was designed to measure overall level of concern for environmental problems. Form D consists of 105 two-option forced choice problems. The choices in Form D are between an environmental option and another social issue, such as inflation.

To measure cognition forms A and B were used as pretest and posttest respectively. Form D was used as both pretest and posttest to determine affective changes. Table II shows both the Kuder-Richardson Formula 20 and the test-retest reliability coefficient correlation for the Syracuse Environmental Awareness Test.

General Design of the Course

The instruction for both groups was based on the concept that "Man Exists in a Dynamic Relationship With His Enviornment." There were twelve course objectives which were:

1. Develop of Definition of Man.

2. Cite examples of factors influencing man's relationship with man.

3. Explore the development of human groups and the indentifying process inherent to these groups.

4. Predict how a person might react under identified circumstances.

5. Develop a definition of technology.

6. Compare the basic objectives of humanity with those of technology.

7. Relate the influences of technology to emerging health problems.

8. Observe and analyze ecologically the role and function of four products of technology.

9. Develop a definition of environment.

10. Examine the meaning of "balance" in man's relationship with the enviornment.

11. Analyze the mental, emotional and social dimensions of man as he adapts to his enviornment.

12. Implement a personal plan to reduce enviornmental pollution.

Both the experimental and the control group had the following constants: (1) The instructor was the same for both groups. (2) Both groups met in the same room. (3) Both groups met in the morning. (4) Both groups met for fifty (50) minutes Monday, Wednesday and Friday for one semester. (5) Both groups were assigned the same text. (6) Both groups had the same lectures, discussion topics, and audio visual mate-

rials available to them. (7) Both classes were approximately the same size, twenty-six (26) students were in the experimental group and twenty-two (22) students were in the control group.

In the experimental group the contract plan of evaluation was utilized. The subjects were evaluated on the number of course objectives which were completed satisfactorily. The criterion used by the instructor to determine the satisfactory completion of course objectives was pendent on whether the students' had actualized the prescribed behavior for that objective, at the cognitive level designated for that objective. For example, the objective "Develop A Definition of Environment" is a level 5.0 (synthesis) objective. Synthesis, according to Bloom, implies an ability to assemble various elements to develop a new whole. Therefore, in order for the students to satisfactorily "Develop A Definition of Environment" they must compile knowledge and values gained about the environment from individual experience and research and organize them into new, individualized, definition of environment. The students in the experimental group received grades according to the number of objectives successfully completed according to the following breakdown. Students must complete twelve (12) objectives for a "A" grade, ten (10) objectives for a "B" grade, and eight (8) objectives for a "C" grade, and six (6) objectives for a "D" grade.

In the control group, a traditional type of student evaluation was used. The students in the control group were evaluated on the scores

they received on three examinations. The examinations were developed from the class lectures, the required text, and the audi-visual presentations. The three examinations were one-hundred (100) points each. Students in the control group had to accumulate two hundred seventy (270) points for an "A", two hundred forty (240) points for a "B", two hundred ten (210) points for a "C" and one hundred eighty (180) points for a "D". It should be noted that the pretest and posttest had no bearing on the letter grade which students received for the course.

Statistical Treatment of Data

Statistical analysis of the test results of the two groups was completed by using an F-ratio, analysis of variance and F-test of significance. The .05 level of significance was used to accept or reject the null hypotheses.

Presentation and Analysis of Data.

The presentation and analysis of data will be divided into two sections. The first section will present the statistical analysis of the cognitive component. The second section will present the results of the statistical analysis of the affective component.

Changes in Cognitive Learning

The control group (Table III) showed a significant increase in cognitive learning between the treatment of the pretest and posttest ($F=9.9297$; $P < .01$). The experimental group (Table IV) showed no significant increase in cognitive leaving between the treatment of the pretest and posttest ($F=1.2680$; $P > .05$). When the groups were combined (Table V) there was no significant difference between the experimental group and the control group ($F=1.02$; $P > .05$). The comparison between treatments (Table V) showed a significant difference in the increase of cognitive behavior between the administration of the pretest and the posttest ($F=17.75$; $P < .01$).

Changes in Affective Behavior

The control group (Table VI) showed no significant change in attitudes between the treatment of the pretest and the posttest ($F=2.2376$; $P > .05$). The experimental group (Table VII) also showed no significant change in attitude between treatments ($F=2.7614$; $P > .05$). When compared (Table VIII) there was no significant difference between the experimental and control groups ($F=.0292$; $P > .05$). The comparison between treatments showed that there was a significant change in attitude between treatments ($F4.9391$; $P < .05$).

Summary and Conclusions

Although there was no statisticly significant difference between the experimental and control groups when compared there were several factors which lend credence to the hypotheses that the traditional method was superior to the contract method. First, there was a significant increase in cognitive knowledge for the control group between the pretest and the posttest. While in the corresponding experimental group there was no significant increase in cognitive knowledge between the pretest and posttest. Second, the experimental group had a larger percentage (92.3%) of Health Science majors than did the control group (59.1%). If it is valid to assume that Health Science majors would be more highly motivated to do well in a course in their major field of study; then the experimental group should have demonstrated greater increases in cognitive and affective behavior.

Perhaps an important factor which lead to these conclusions was the lack of a cognitive measuring device written into the contract. Although the experimental group was given the same educational experiences as the control group, the need to supplement and reinforce the cognitive domain by reading text books and studying for examinations was not an important consideration for the experimental group. The inclusion of a cognitive measuring device should be a prime consideration for educators developing contract plans of evaluation in the future.

Table I

Breakdown of Items by Content for Forms A and B

Content	Cognitive Process: Knowledge of: Fact and Items	Principles	Ability to Apply Principles	Total
Pollution	17	4	3	24
Science, Growth and Technology				
Ecological Relations	9	5	2	16
Population	8	4	4	16
Total	34	13	9	56

Table II

Reliability of the Syracuse Environmental Awareness Tests

S.E.A.T. Form	KR 20	Test - Retest
Form A	.83	.79
Form B	.84	.76
Form D	.95	.75

Table III

Analysis of Variance for the Control Group - Cognitive

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Treatments	927.14	1	927.14	9.9297[a]
Error	4014.75	43	93.37	
Total	4941.89	44		

[a] $p < 0.05$

Table IV

Analysis of Variance for the Experimental Group - Cognitive

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Treatments	165.65	1	165.65	1.2680
Error	6662.47	51	130.64	
Total	6828.12	52		

[a] $p < 0.05$

Table V

Analysis of Variance Between Groups - Cognitive

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Groups	51.39	1	51.39	1.02
Between Treatments	894.55	1	894.55	17.75[a]
Interaction	197.27	1	197.27	3.91
Residual	9678.19	93	50.41	
Total	10821.40	96		

[a] $p < .05$

Table VI

Analysis of Variance For The Control Group - Affective

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Treatments	856.10	1	856.10	2.2376
Error	16461.18	43	382.82	
Total	17317.78	44		

[a] $p < .05$

Table VII

Analysis of Variance for the Experimental Group - Affective

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Treatments	906.04	1	906.04	2.7614
Error	16733.04	51	358.11	
Total	17639.87	52		

[a] $p < .05$

Table VIII

Analysis of Variance Between Groups - Affective

Source of Variation	Sum of Squares	DF	Mean Squares	F
Between Groups	10.41	1	10.41	.0292
Between Treatments	1763.17	1	1763.17	4.9391[a]
Interaction	1.29	1	1.29	.0036
Error	33198.88	93	356.98	
Total	34973.06	96		

[a] $p < .05$

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